

# **CERES Data Management System**

**Items for Discussion - April, 1997**

**Schedule**

**Working Group Status**

**Release 2 Development and preparations for TRMM**

**Current Release 2 Issues**

**Near-term Plans**

Contributions to this report from:

John Chapman  
Kay Costulis  
Chris Currey  
Michelle Ferebee  
Erika Geier  
Calvin Mackey  
Maria Mitchum

Lisa Coleman  
Joey Escuadra  
Kam-Pui Lee  
Beth Flug  
Tim Murray  
John Robbins  
Carol Tolson

J.F.Kibler@LaRC.NASA.GOV  
Data Management Office  
Atmospheric Sciences Division  
NASA Langley Research Center

## **Significant events since last Science Team Meeting**

**TRMM launch date formally slipped from August to November 1997**

**TRMM Mission Simulation #1 in November 1996 helped resolve many issues**

**ECS Release A replaced by backup LaTIS system at LaRC DAAC for TRMM processing**

**'Emergency Backup' to ECS Release B planned as extension of LaTIS system**

**CERES Release 2 Data Products Catalog published to define at-launch products**

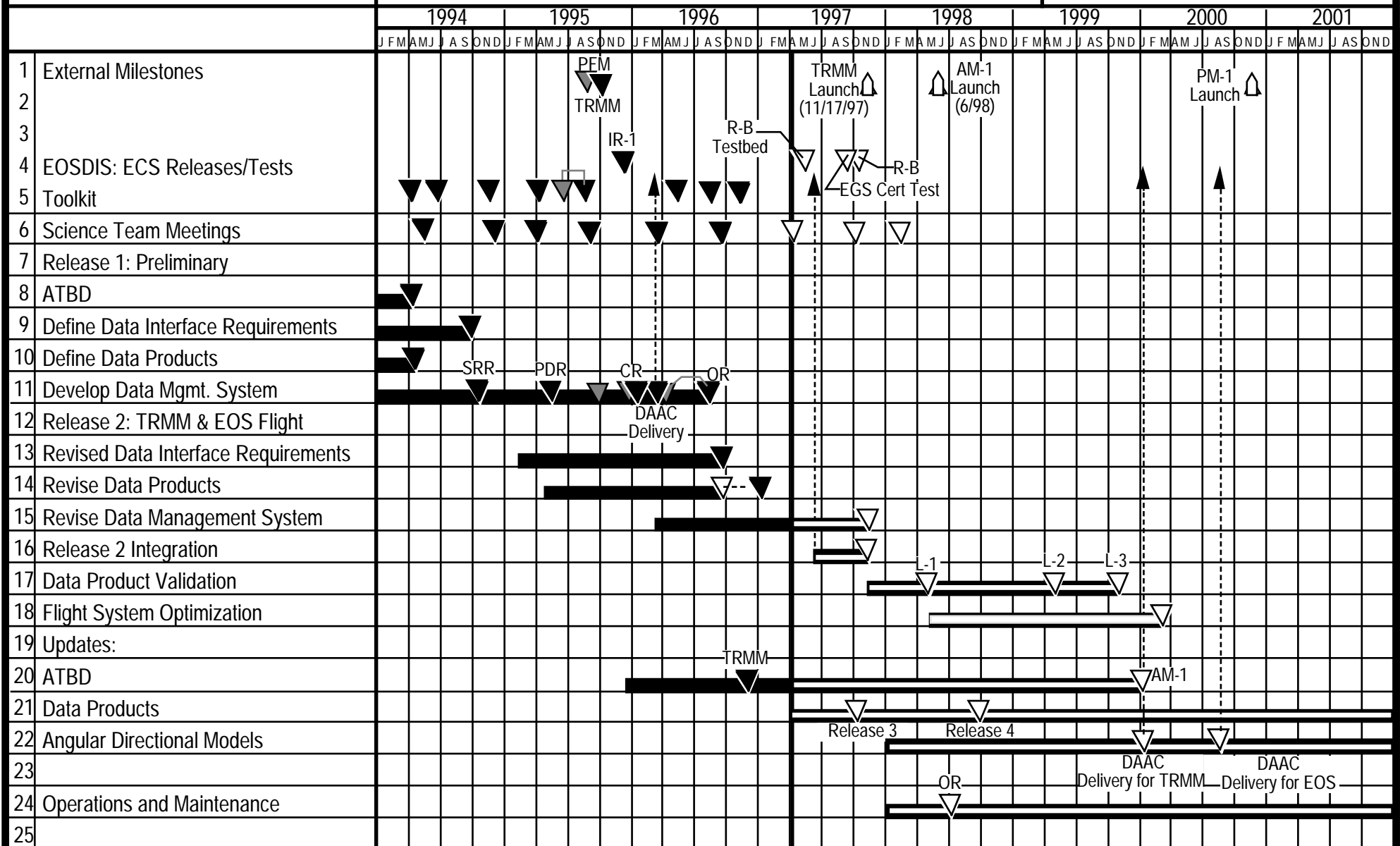
**Substantial progress on Release 2 Data Management System integration and testing**

# CERES

## Data Management System Development

LEVER

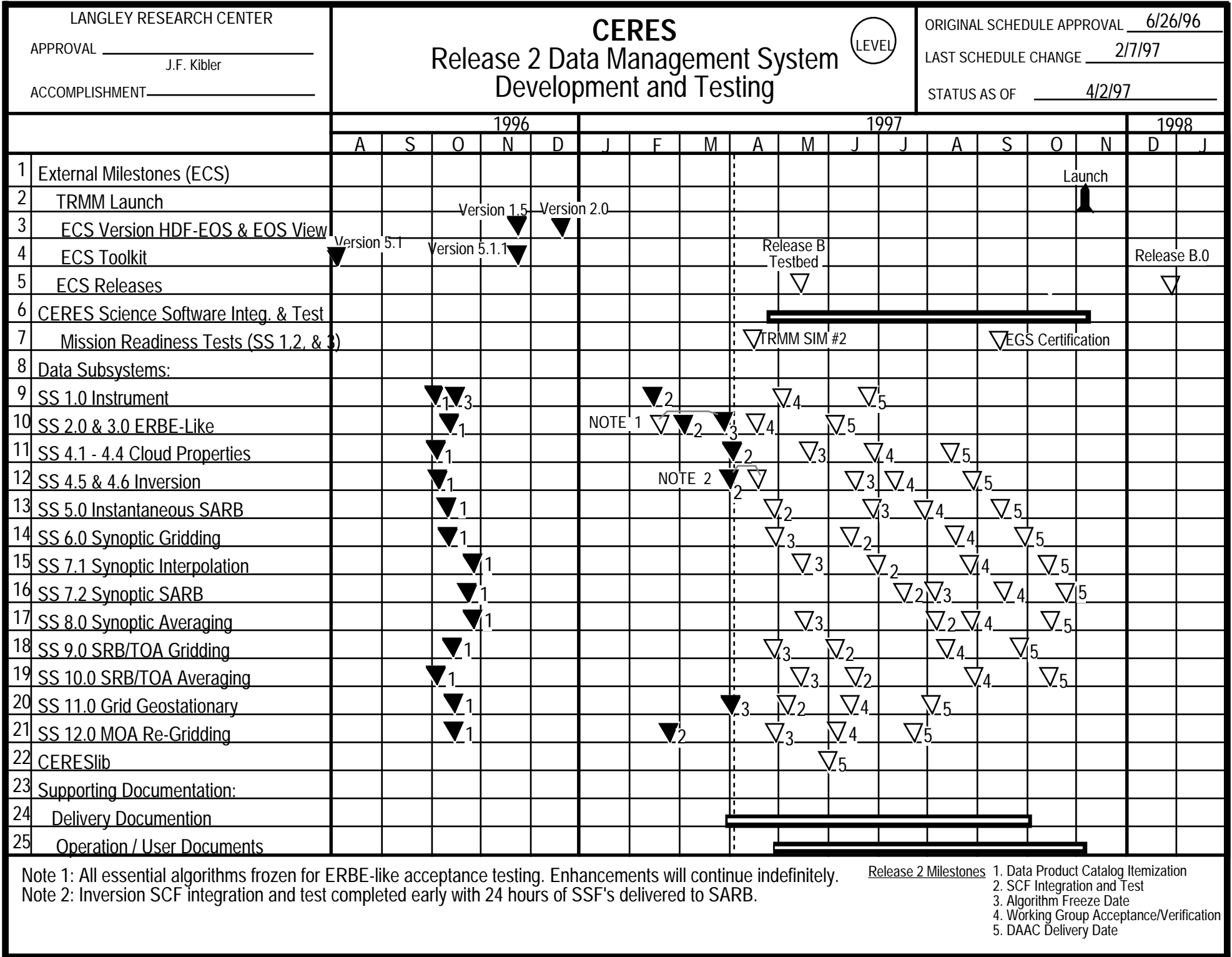
STATUS AS OF 4/2/97



KEY:  Base  
CR: Code Reviews  
ATBD: Algorithm Theoretical Basis Documents

▽ Baseline

OR: Operations Reviews  
SRR: Software Requirements Reviews  
PDR: Preliminary Design Reviews  
L - # : Level 1, 2, & 3 Data Products



## **External Interfaces and Mission Operations**

### **Responsible for:**

- **Negotiations with GSFC, EOS, and TRMM Projects**
- **Coordination with Langley CERES Project Office and TRW**
- **TRMM & EOS Instrument monitoring, real-time displays, instrument health and status**
- **Software to distribute/analyze housekeeping data from TRMM IST to LaRC workstations**

### **TRMM:**

- **Participated in TRMM I&T held September 10-12, 1996.**
- **Participated in TRMM Mission Simulation #1 held November 1-4, 1996.**
  - **Monitored selected real-time passes to test com links and displays.**
  - **Identified items to be corrected at TRMM MOC for next tests.**
- **Developed a web-based tool for accessing and analyzing CERES housekeeping data.**

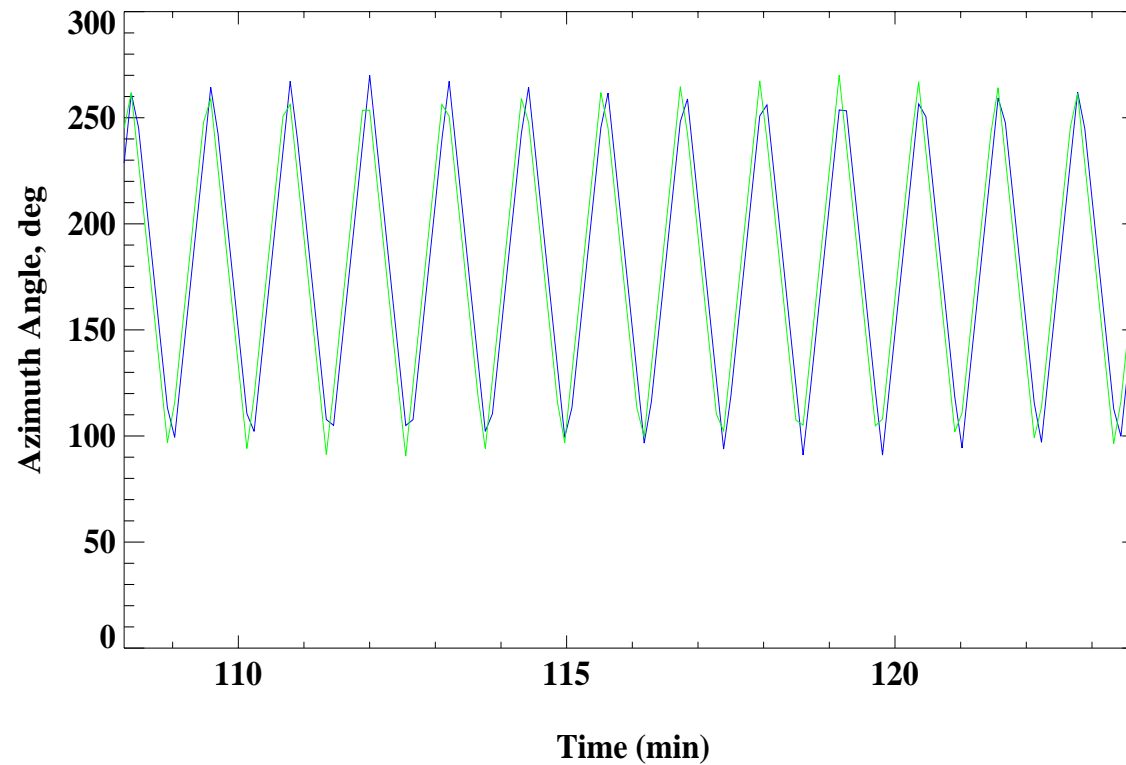
### **EOS-AM:**

- **Release A of the EOS-AM Instrument Support Toolkit demonstrated at LaRC March, 1997.**
- **IST software now installed on workstations to begin evaluation.**

### **Near-term Plans:**

- **TRMM I&T test to be held April 22-25.**
- **TRMM Mission Simulation #2 for testing end-to-end science and real-time data interfaces planned for May 7-May 10.**
- **EOS-AM Instrument Operations Meeting scheduled for May 27-29.**
- **Continue to work flight operations details with TRMM and EOS-AM personnel.**

## Housekeeping Measurements Captured from Real-Time 'Snap' Files



**SNAP FILE :** LARCSNAP.40000

**PLOT DATE:** 03/27/1997 07:38:59.000

**DATA DATE:** (Start) 98-051-01:48:15.635  
(End) 98-051-02:03:46.251

**Channel**

**Min**

**Max**

CAZPOSS1

91.0022

270.009

CAZPOSS2

90.5740

270.059

## **TRMM Mission Simulation #1**

**CERES and DAAC teams at Langley and TRMM and EOSDIS teams at GSFC conducted end-to-end simulation for three days over the weekend of 11/1 through 11/4/96**

- The TRMM satellite and instruments (located at the GSFC Integration and Test Facility) were commanded through almost all operational modes from the TRMM Mission Operations Center (MOC) using TDRSS links.**
- Both real-time housekeeping and science telemetry data from CERES were transmitted from the TRMM satellite through TDRSS to the PACOR Level 0 processing facility at GSFC.**
- Real-time displays and data files from the MOC were transmitted through secure NASCOM lines to the CERES Instrument Support Workstation in ASD and then broadcast through the LaRC television network for remote monitoring and analysis of instrument health and safety parameters by CERES Operations and Instrument Team personnel.**
- After initial processing at PACOR, the Level 0 science data stream was transmitted to the LaRC DAAC both as quick-look and 24-hour data files and captured using EOSDIS ingest system.**
- Within hours, the science data was processed through the Instrument Subsystem of the CERES Data Management System operating on the Science Computing Facilities to produce data products for evaluation of instrument operations.**
- Many anomalies in both the software and our operational procedures have been found and corrected as a direct result of the realistic simulation.**

**This simulation demonstrated the successful operation of virtually all elements of the data systems needed to support the CERES launch on TRMM.**

**It would not have been possible without the close cooperation of the people from many organizations at both Langley and Goddard.**

/disk1/thunder/neely/VISUALIZATION/IES\_POINT\_REL2/Poi

# Data Explorer

Main IES

File Edit Execute Panels Options Help

FileSelector  
S\_A1\_1998022000\_19970409" ...

Show Invalid Dat  
No ☐

Render Global Image as:  
Data colored points ☐

Parameter 1  
SW\_Filt\_Radiance ☐

Parameter 1 Image Status  
◆ Auto Reset  
◆ Zoom

Parameter 1 Image  
◆ On  
◆ Off

Box  
off ☐

Parameter 2  
Sample Number ☐

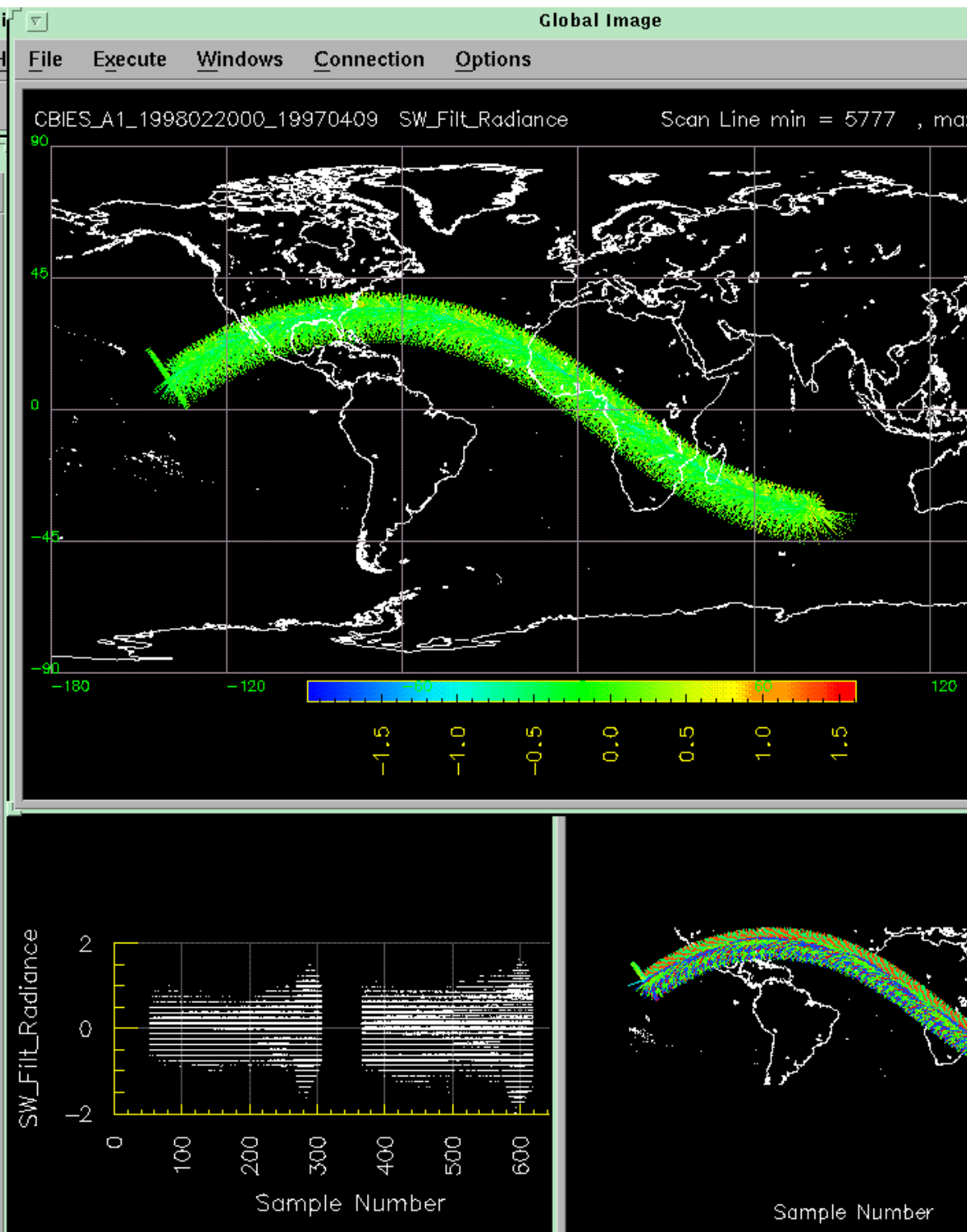
Parameter 2 Image Status  
◆ Auto Reset  
◆ Zoom Cntrl g

Parameter 2 Image  
◆ On  
◆ Off

Line Plot  
◆ Off  
◆ Index vs P1  
◆ Index vs P2  
◆ P2 vs P1  
◆ Index vs (P1 + F

Min Scan Line  
0

Max Scan Line  
50000





# **CERES Instrument Simulator**

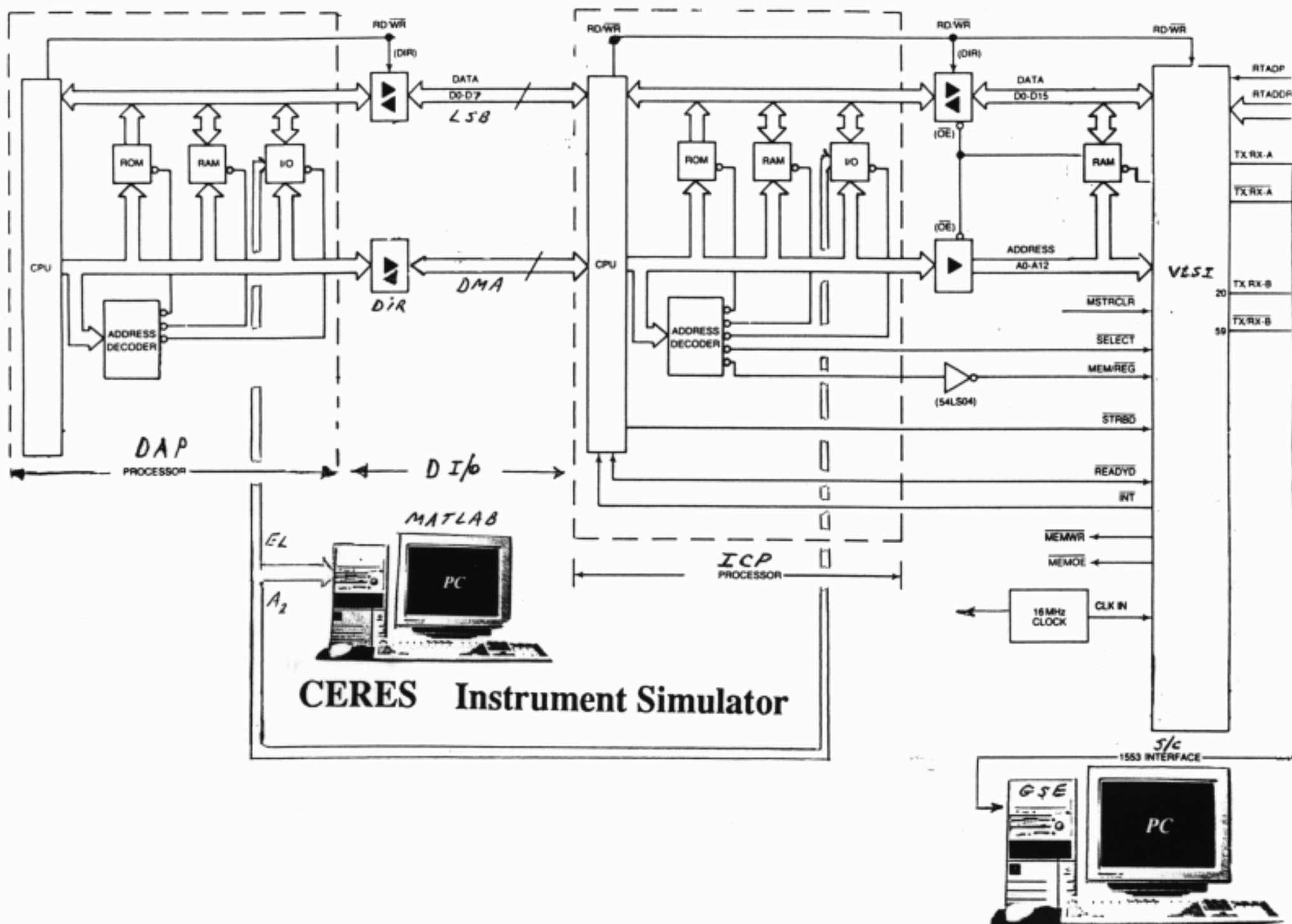
**Flight processor simulation for validation of re-programming and in-flight anomaly investigation**

## **Current Status:**

- **Simulator CERES / TRW cards now running flight code at 16 Mhz**
- **SRAM and EPROM memory adapters functional with inexpensive commercial grade chips**
- **Digital I/O & Digital I/F, ICP, DAP & SC I/F interface cards rewired to reduce crosstalk/glitches**
- **TRW / GSE software installed on host Pentium PC**
  - **Housekeeping data displays functional from actual TRMM playback data**
- **TRW flight code executes at full processor speed with ICP now in Main Loop!**
- **Host-PC software: Azimuth & Elevation “virtual instrument” ready as Matlab executable code**
- **Host-PC cards: I/O cards for Matlab/Simulink interrupt driven by CERES processor are ready**
- **1553 interface : BCU software ready for PC link to spacecraft interface card**

## **Near-term Plans:**

- **Logic Analyzer being used as debugger to track and document boot-up of ICP/DAP**
- **Use TRW/GSE screen to monitor system performance with 1553 link to SRAM**
- **Achieve “main loop” continuous mode operation of ICP & DAP**
- **Interface Matlab “virtual instrument” executable code to I/O ports**



## **Working Group: Instrument**

### **Responsible for:**

- **Subsystem 1 (Instrument Geolocate and Calibrate Earth Radiances)**

### **Data Products:**

- **BDS (Bi-Directional Scan)**
- **IES (Instrument Earth Scan)**

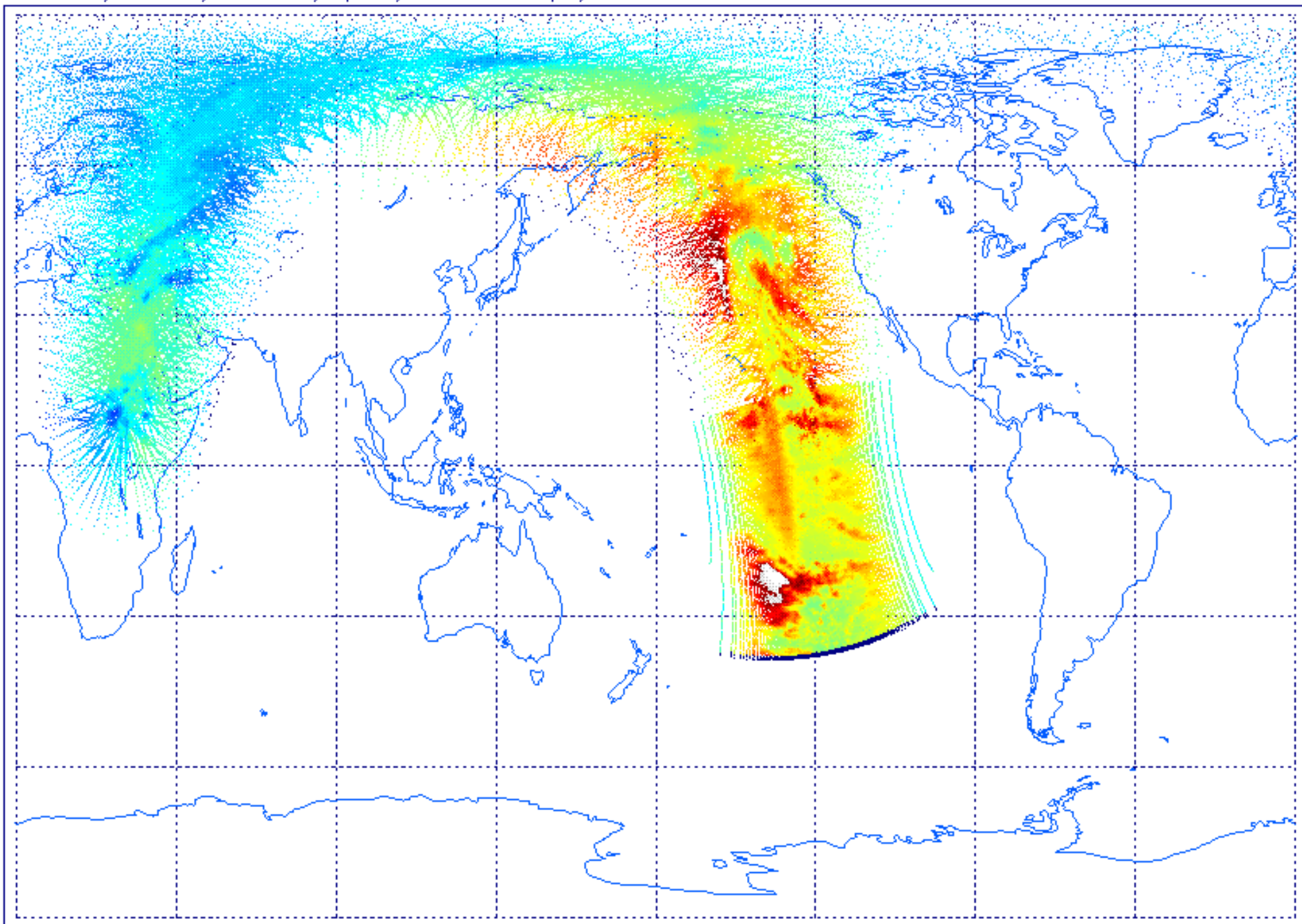
### **Current Status:**

- **Release 2 system architecture implemented; testing and verification underway**
- **Additional system QC and analysis reports being designed and implemented**
- **Processed data from TRMM Simulation #1**
  - **Subsystem ported and now testing installation on DAAC system**
  - **Ephemeris/Attitude preprocessor verified**
- **Developing graphical analysis tools using IDL**
- **Completed full month simulation data set for TRMM**
  - **Interpolated ERBE data with ADM adjustment for different geometry**
  - **All CERES operating modes: FAPS, RAPS, short scan and anomalies**

### **Near-term Plans:**

- **Preparing for TRMM Simulation #2 - to process science data at DAAC similar to flight**
- **Continue verification of system functionality, output products**
- **Deliver flight ready system to DAAC for TRMM launch**
- **Implement support for EOS platforms**

/CERES/scratch/kplee/simceresraps/IES\_861001\_00 Total Channel - SIMULATED IES



## **Working Group: ERBE-like**

### **Responsible for:**

- **Subsystem 2 (ERBE-like Inversion to Instantaneous TOA Fluxes)**
- **Subsystem 3 (ERBE-like Averaging to Monthly TOA Fluxes)**

### **Data Products:**

- **ES-8 (Equivalent to ERBE Instantaneous TOA Estimates)**
- **ES-9 (Monthly Averaged Regional Parameters)**
- **ES-4, ES-4G (Monthly Averaged Regional, Zonal, Global Parameters by region and gridded)**
- **Scene ID Ancillary Input Data, Spectral Correction Ancillary Input Data**
- **Solar Declination values for each year, Albedo Directional Model values**

### **Current Status:**

- **Added capability to process RAPS data through Subsystems 2.0 and 3.0 separately from FAPS.**
- **Modified Subsystem 2.0 code to stop measurement level processing after estimating the scene type (no TOA calculation) for measurements flagged as Short Scan, Rapid Retrace Mode.**
- **For ERBE reprocessing, added code to address the 2% SW channel problem for NOAA 9 and the 1% drift problem (SW component of total channel) for ERBS.**
- **Replaced ERBE SW ADMs with new ones based on Radiance Pairs Method.**
- **Generated 64 months of snow data for ERBE scanner data reprocessing.**
  - **Nimbus-7 SMMR (Nov'84 - Jun'87) and DMSP F8 SSM/I (Jul'87 - Feb'90)**

### **Near-term Plans:**

- **Run 4 ERBS validation months through the ERBE-like Subsystems.**
- **Complete testing of new seasonal LW ADMs.**
- **Continue analysis of NOAA-9 and NOAA-10 calibration for potential reprocessing.**



## ERBE-like Data Validation

Product:	<input type="text" value="ES4G"/>
Year:	<input type="text" value="1986"/>
Month:	<input type="text" value="Oct"/>
SC:	<input type="checkbox"/> N9 <input checked="" type="checkbox"/> ERBS <input type="checkbox"/> N10
ClearSky:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Parameter:	<input checked="" type="checkbox"/> Albedo <input type="checkbox"/> Shortwave <input type="checkbox"/> Longwave

Show Plot

Get PS

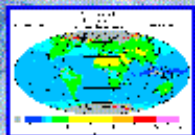
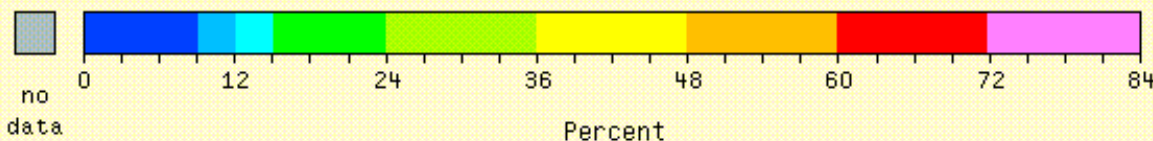
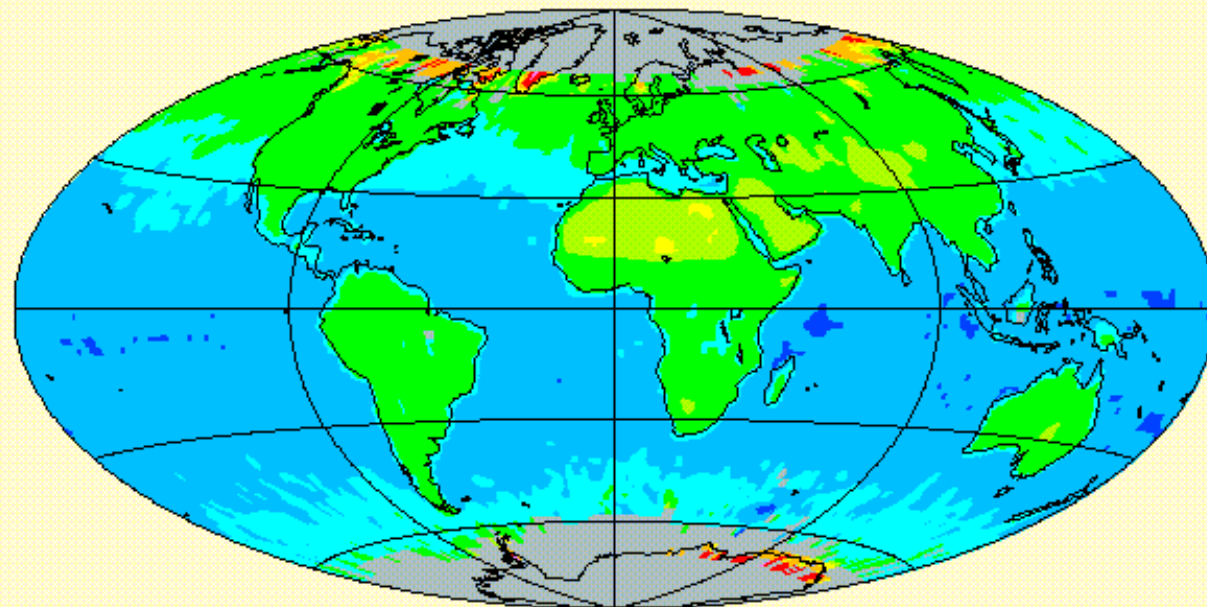
Georgia Liu [g.liu@larc.nasa.gov](mailto:g.liu@larc.nasa.gov)

## Clear-sky Albedo from CERES ERBE-like Processing

DP Date: 1997/01/07  
File Name: ES4G2\_198610\_2

ERBS October 1986 ES-4  
2.5-deg Equal Angle

Monthly Mean(Hour)



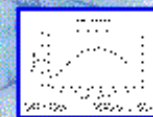
ES4/ES4G



ES8



ES10



QCplot



Help



# ERBE-like Inversion Validation Graphics

Year: 1986

Month: Oct

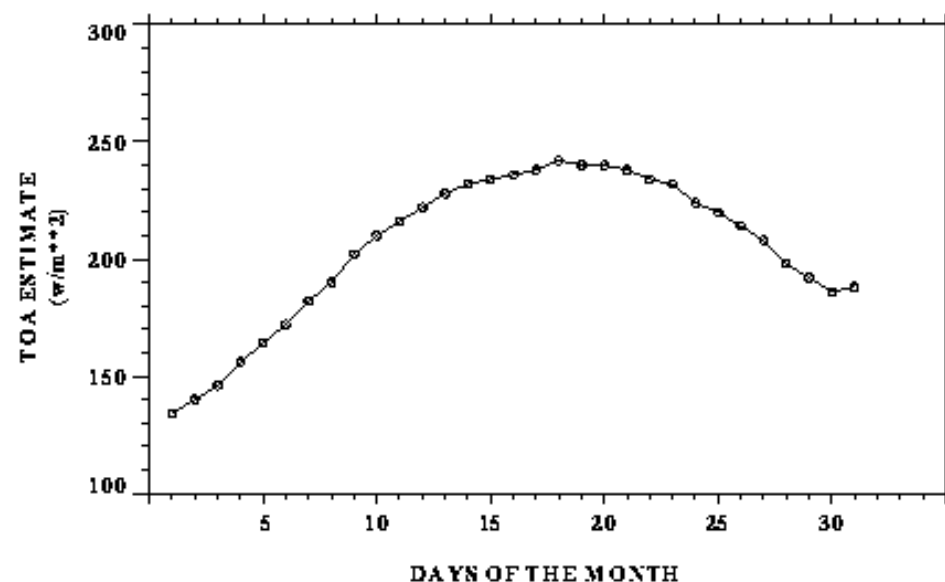
SC: TRMM

PlotType: Shortwave (TOA)  
Longwave (TOA)  
Albedo (TOA)  
Daytime %: Clear Sky, Tot Cloud Ar  
Nighttime %: Clear Sky, Tot Cloud

Create Plot

Contact: Beth Flug ( [b.t.flug@larc.nasa.gov](mailto:b.t.flug@larc.nasa.gov) )

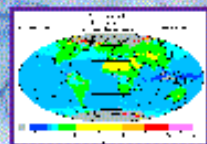
## DAILY AVERAGES



SATELLITE : ERBS  
INSTRUMENT : SHORTWAVE  
CHANNEL : SCANNER

DATA DATE : OCT 1986  
PROCENNING DATE : 01/10/96 - 01/10/96  
PLOT GENERATION DATE : 04/02/97

[[Next Plot](#)] [[Display PostScript Plot](#)]



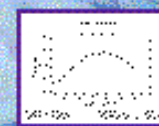
ES4/ES4G



ES8



ES10



QCplot



Help

## **Working Group: Clouds**

### **Responsible for:**

- **Subsystem 4.1 - 4.3 (Clear/Cloud Detection, Cloud Layers, Optical Properties)**
- **Subsystem 4.4 (Convolution with CERES Footprint)**

### **Data Products:**

- **SURFMAP (Surface Map and Properties)**
- **VIRS & MODIS & AVHRR (Cloud Imager Data)**
- **CRH (Clear Reflectance/Temperature History)**
- **CookieDough, CloudVis, FOOTPRINTVal**
- **Intermediate SSF (Single Satellite Footprint - Cloud Properties)**

### **Current Status:**

- **F90 Production code running on SCF SGI in 64-bit mode, Irix 6.2 using Toolkit, HDF, Cereslib**
- **Tested operational scenario processing using simulated VIRS data.**
- **Produced Pathfinder data set for October 1, 1986**
- **Integrated new versions of algorithms as needed**
- **Working with contributors to adjust algorithms to accommodate new VIRS channel.**
- **Validation testing in-progress**
  - **Tested RAPS mode in convolution with overlap imager data**
  - **Read IES input in HDF**
- **Revised SS4.4 from four cloud categories to two variable height cloud layers**

### **Near-term Plans:**

- **Release 2 delivery**
- **Complete simulation of VIRS test data set by generating radiances.**



## **Working Group: Inversion and Surface Estimation**

### **Responsible for:**

- **Subsystem 4.5 (CERES Inversion to Instantaneous TOA Fluxes)**
- **Subsystem 4.6 (Estimate Longwave and Shortwave Surface Radiation Budget)**

### **Data Product:**

- **Archival SSF (Single Satellite Footprint, TOA and Surface Flux, Clouds)**

### **Current Status:**

- **Release 2 SSF data product finalized and parameter definitions known**
- **Conversion to Release 2 software well underway**
- **Generating version of software that will compile and run using both SGI and NAG F90 compilers**
- **Updating software which compares Release 2 SSF and ES-8 TOA fluxes and scene types**

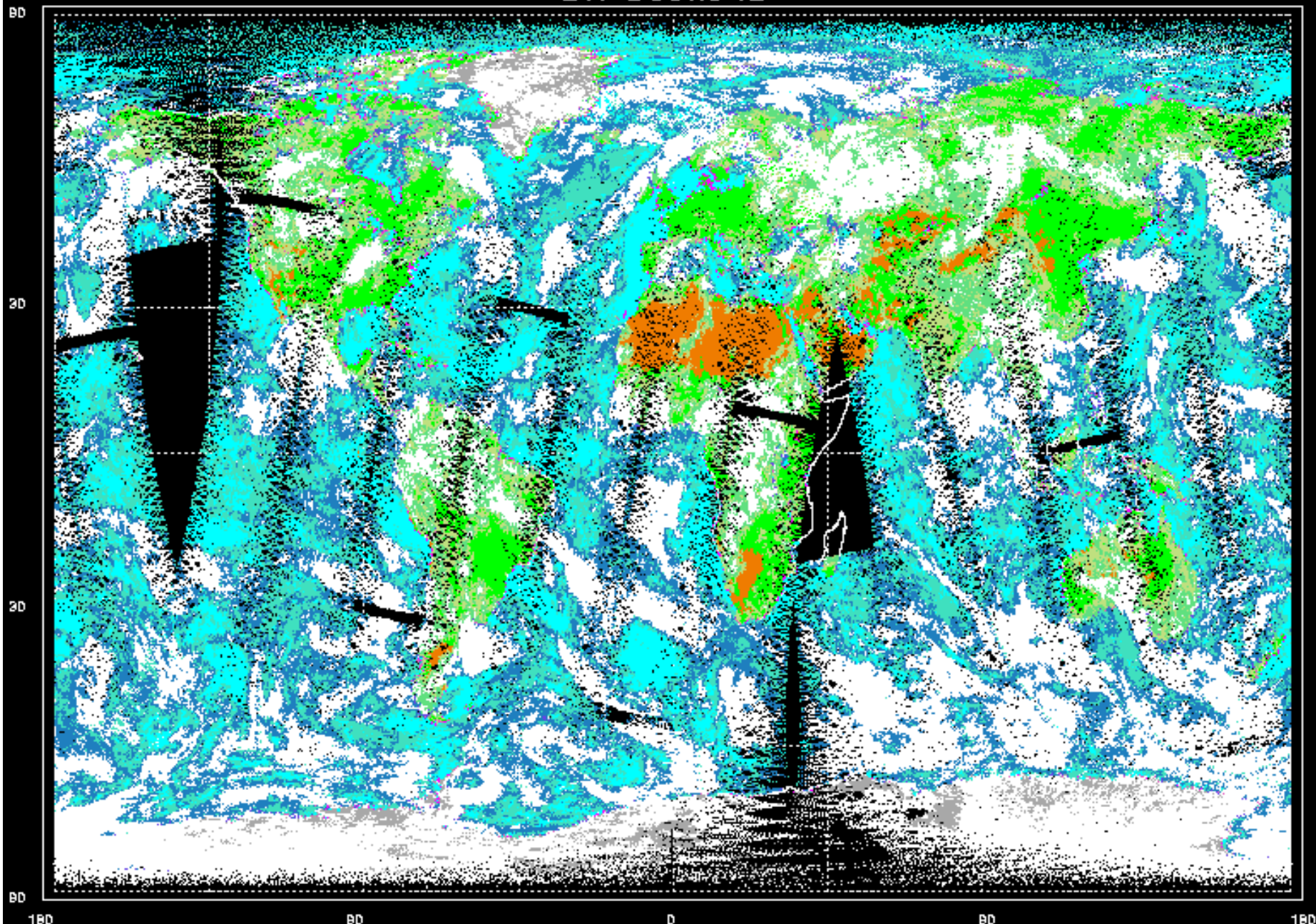
### **Near-term Plans:**

- **Finalize QC report requirements and finish implementing**
- **Implement core metadata and add product specific metadata as needed**
- **Make all adjustments needed to run on LaTIS system**
- **Complete documentation required for DAAC delivery**
- **Finish testing Release 2 software**
- **Write postprocessor to convert binary SSF to HDF for archival and distribution**

Data Date: 1996-10-01T00:00  
Process Date: 1997-04-01T09:30

# SSF LW Scene ID

Number of Hours: 12  
Satellite: ERBE



CL Ocean PC Ocean MC Ocean CL Land PC Land/ Desert MC Land/ Desert CL Desert CL Snow CL Coastal PC Coastal MC Coastal Overcast Unknown

Initial File: /CERES/inversion/data/scr/Compare/SSF00.CMP

Plot Date: Apr 2, 1997 14:06

# **Working Group: SARB - Surface and Atmospheric Radiation Budget**

## **Responsible for:**

- **Subsystem 5.0 (Compute Surface and Atmospheric Fluxes)**
- **Subsystem 7.2 (Synoptic Flux Computation)**
- **Subsystem 12.0 (Regrid MOA)**

## **Data Products:**

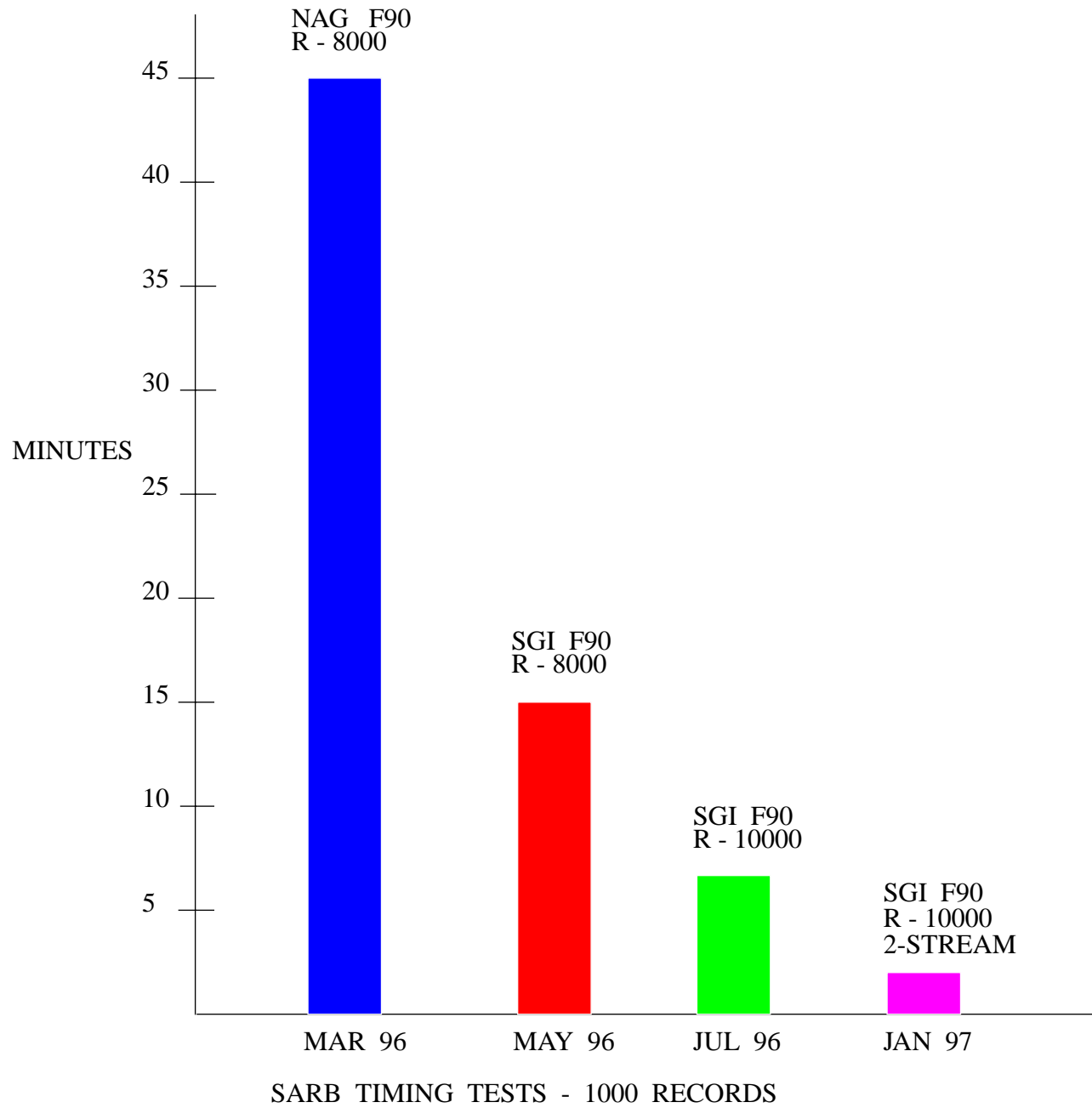
- **CRS (Single Satellite Footprint, and Radiative Fluxes and Clouds)**
- **SYN (Synoptic Radiative Fluxes and Clouds)**
- **MOA (Meteorological, Ozone, and Aerosol)**
- **MWH, APD, GAP, OPD External Ancillary Data Inputs**

## **Current Status:**

- **Subsystem 12.0 has capability to use either the DAO or NCEP meteorological data as input, and to regrid the aerosol and ozone data to the same grid as the input meteorological data**
- **DAO-based MOA data for all of October 1986 has been generated and is in use by the Clouds, Inversion, and SARB Working Groups**
- **Subsystem 5.0 has been successfully modified to use the Release 2 structures for the SSF and MOA input products and the CRS output product**
- **Subsystem 5.0 now using the recent faster, 2-stream version of the Fu-Liou model**

## **Near-term Plans:**

- **Development of an Aerosol Optical Depth backup climatology**
- **Process Subsystem 5.0 with as much data as possible**
- **Update Subsystem 7.2 with same changes as Subsystem 5.0**



# **Working Group: TISA - Time Interpolation and Spatial Averaging**

## **Responsible for:**

- Subsystem 6 (Hourly Gridded Single Satellite Fluxes and Clouds)
- Subsystem 7.1 (Time Interpolation for Single and Multiple Satellites)
- Subsystem 8 (Compute Regional, Zonal and Global Averages)
- Subsystem 9 (Grid TOA and Surface Fluxes)
- Subsystem 10 (Compute Monthly and Regional TOA and SRB Averages)
- Subsystem 11 (Grid Geostationary Narrowband Radiances)

## **Data Products:**

- FSW - Hourly Gridded Single Satellite Fluxes and Clouds (Subsystem 6)
- SYN - Synoptic Radiative Fluxes and Clouds (Subsystem 7)
- AVG, ZAVG - Monthly Regional, Zonal and Global Radiative Fluxes and Clouds (Subsystem 8)
- SFC - Hourly Gridded Single Satellite TOA and Surface Fluxes (Subsystem 9)
- SRBAVG - Monthly Regional TOA and SRB Averages (Subsystem 10)
- GGEO - Ancillary Data Product: Gridded Geostationary Data (Subsystem 11)

## **Current Status:**

- Cancelled 'Footprint Smoothing' treatment
- All subsystems revised internal code for 'nested-grid' concept (1 degree latitude, nested longitude)
- Final Data Products will be in Binary, HDF and HDF-EOS, on the EOS 1 degree modelling grid
- Incorporated all geostationary B1 contributed code, adding calibration and navigation routines
- Closing in on algorithm FREEZE dates within 4 weeks

## **Near-Term Plans:**

- Enhance validation tools
- Working hour overlap and month overlap logic for Subsystem 9 (Local Hours)
- Continue Release 2 objectives: product metadata; code refinements, corrections, optimization; documentation

# **CERES System Engineering Committee**

**Charter: Coordinate solutions to issues which cross working group boundaries**

**Members: Maria Mitchum (DMO), Sandy Nolan (SAIC), Jill Travers (DAAC)**

## **Items Resolved:**

- **Published computer bulletin on “Environment Variables, Makefiles, Scripts and PCF Files”  
- See <http://asd-www.larc.nasa.gov/ceres/docs.html>**
- **Revised Release 2 Development Schedule with re-defined subsystem milestones to meet new TRMM launch and ECS target dates**
- **Defined almost 200 Earth Science Data Types (ESDT's) for TRMM subsystem input and output products to be used by ECS. Established ESDT shortname convention.**

## **Current Issues:**

- **Determination of mandatory product metadata for each of our output products**
- **System guidelines for Quality Assessment reports for each subsystem**
- **LaTIS development and impact on software requirements**
- **Documentation Guidelines and Release 2 delivery schedule**



## **Validation and Visualization Aids**

**Develop tools for visualizing CERES data products to assist software development and support production processing and validation - understand the data and identify discrepancies**

### **Features:**

- **Interactive visualization and analysis**
- **Visualize CERES archival and validation data products**

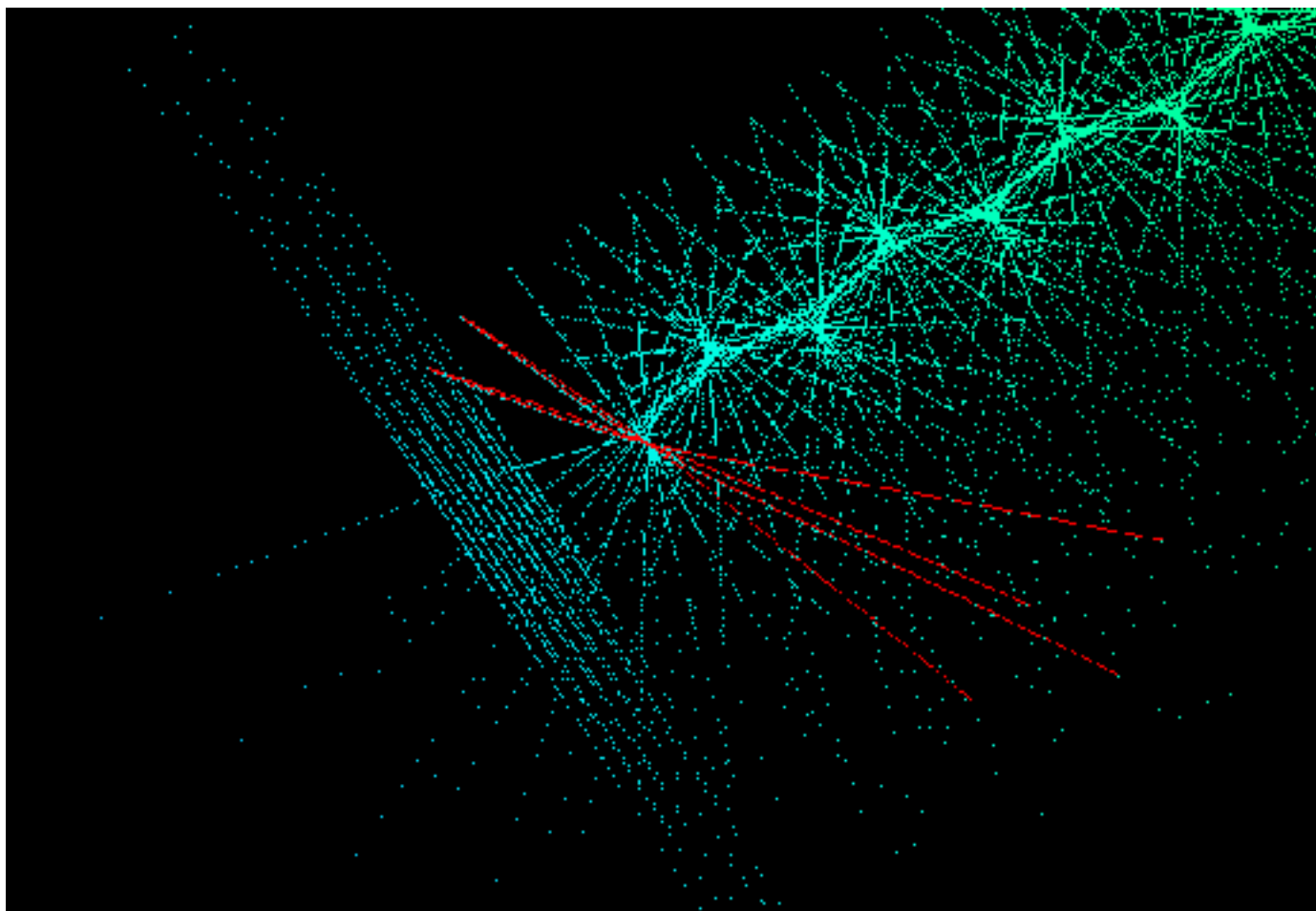
### **Current Status:**

- **Developed IBM Data Explorer point, swath, and gridded visualization programs**
- **Support IES, BDS, SSF, and ES-8 archival products**
- **Support CloudVis and Gridded Cloud Product validation products**
- **Developed Coastline Detection Program for analyzing CERES geolocation accuracy**

### **Benefits & Findings:**

- **Clouds WG found anomalies with cloud mask over desert and sunglint regions**
- **Instrument WG found space clamp problems and mode transition processing errors**
- **Coastline detection program demonstrates power of embedding algorithms in interactive environment**
- **Able to interactively analyze 24 hours of BDS data ~8.6 million data points/parameter**

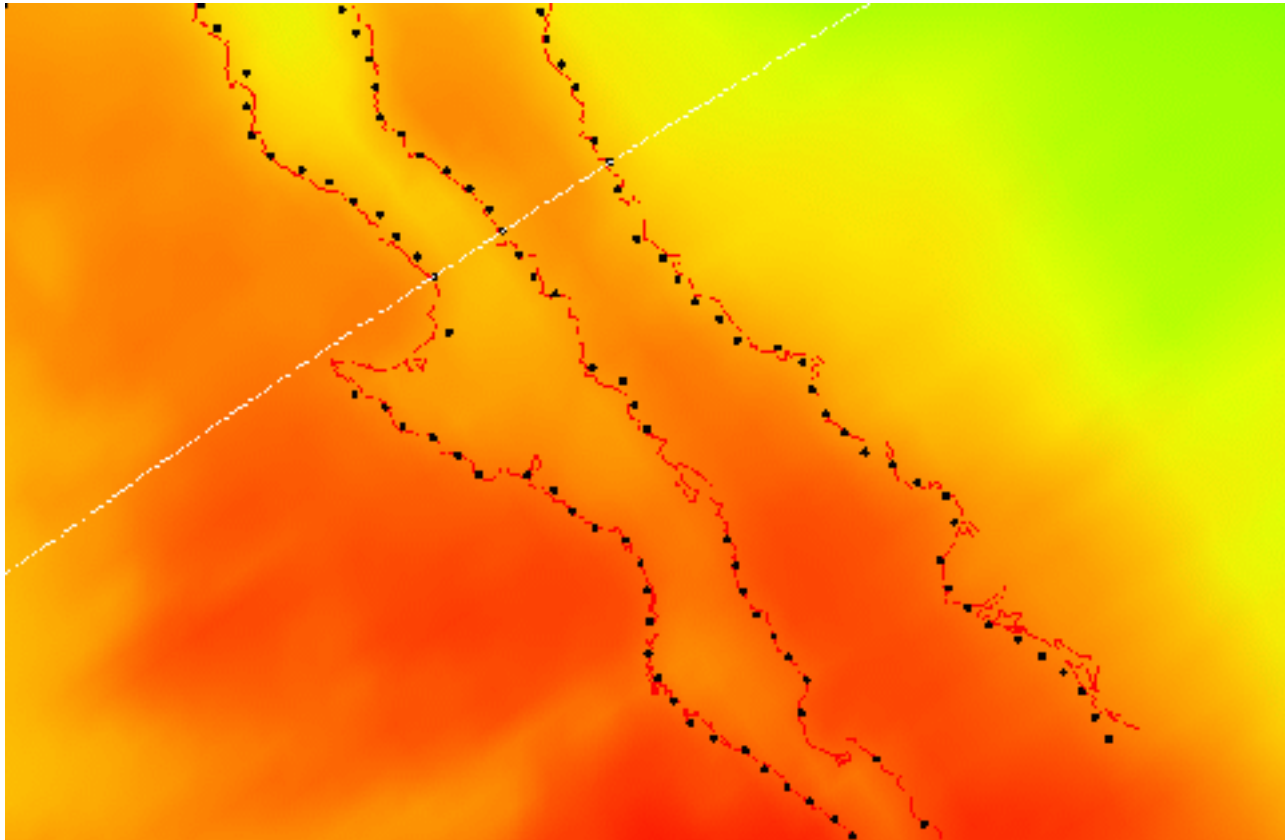
**BDS Release 2 Visualization - FAPS Normal Scan to RAPS Short Scan**  
**File: CBDS\_A1\_54\_19980220\_19970317**



Transition from cross-track to RAPS mode caused geometry errors detected by visualization - now corrected



## Coastline Detection - Baja California, 2W delta, 25 km, Nighttime



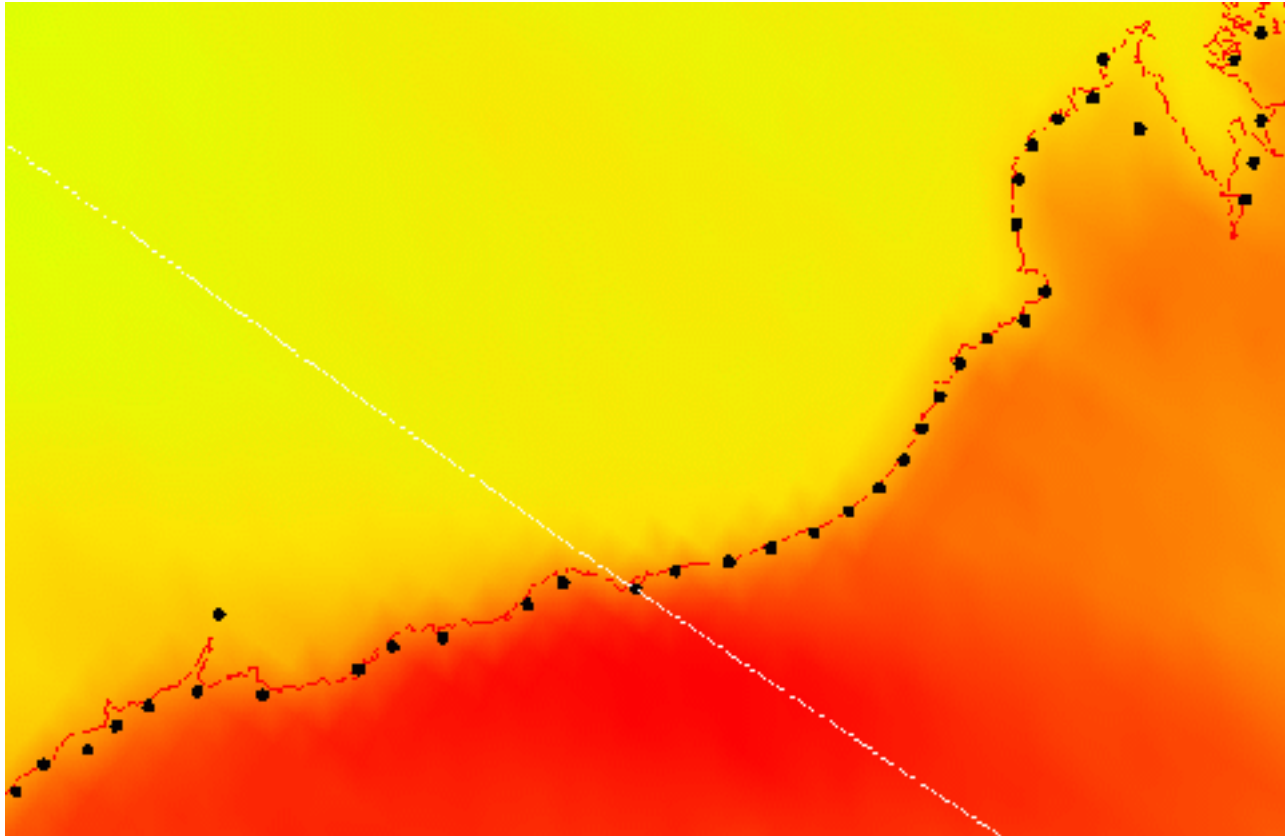
**Satellite: ERBS**  
**Date: 11/30/84**  
**Scan: Left-Right**

**Orbital Motion: Descending**  
**Latitude Error: 0.012**  
**Longitude Error: -0.014**

**Cross-track: 0.005**  
**Along-track: 0.012**  
**(see Hoffman, NASA TP 2670)**

A technique to validate geolocation calculations based on similar ERBE method

# Coastline Detection - Australia, 2W Delta, 25 km, Daytime



Satellite: ERBS  
Date: 11/09/84  
Scan: Right-Left

Orbital Motion: Ascending  
Latitude Error: -0.054  
Longitude Error: -0.020

Cross-track: 0.046  
Along-track: -0.034  
(see Hoffman, NASA TP 2670)

## **Science Computing Facilities**

### **Development and science support server (thunder):**

- **SGI Power Challenge XL (IRIX 6.2) configured to match DAAC (ECS) as closely as possible**
- **Added 4 R10000 processors for a total of 12**
- **Added 2 Gigabytes of memory for a total of 4 GB**
- **Now at 150 GB of local disk space**
- **Installed the latest versions of SGI and NAG Fortran 90, SGI Ada 95**
- **114 GB optical disk jukebox (transfer speeds are slow)**

### **New development, integration and testing server (lightning):**

- **SGI Origin 2000 (IRIX 6.4) configured to match DAAC (LaTIS) as closely as possible**
- **16 R10000 processors**
- **358 GB of disk space (goal is to provide enough storage for 1 month of validation products)**
- **FDDI link to cluster the two development and test servers**

### **Installed EMASS tape library as a near line mass storage device:**

- **Current capacity is 5 TB native and 11 TB compressed (using DLT 4000 tape technology)**
- **Future upgrades may double this capacity (using DLT 7000)**
- **Optimum transfer rate is 5 MB/sec (significantly faster than optical disk)**

### **Workstations supporting development:**

- **Most Sun workstations have been upgraded from SunOS 4.1.3 to Solaris 2.5**
- **Most SGI workstations have been upgraded from IRIX 5.3 to IRIX 6.2**
- **Network upgrades are underway (to add a dedicated 10 Mbps connection to each workstation and a dedicated 100 Mbps connection to each server)**

## Estimated Size of I/O and Archival Products (TRMM) - 4/97

Working Group	Subsystem	I/O Per Run, MB	Archive Per Run, MB	Runs per Month	Archive per Mo., MB	9/96 Est., MB	6/95 Est., MB
Instrument	1.0 Geolocate and Calibration	1774	480	31	14880	22039	19437
ERBE-Like	2.0 Inversion to TOA	743	474	31	14683	10881	8550
	3.0 Averaging to Monthly TOA	308	96	1	96	543	574
Clouds	4.1 - 4.3 Cloud Property Retrieval	1222		744			10416
	4.3.1 - Update CRH	134	134	744	99696	273	
Inversion	4.4 Footprint Convolution	1094		744			
	4.5 - 4.6 TOA and SRB Estimation	556	262	744	194705	176774	241056
SARB	5.0 Surface and Atmospheric Fluxes	368	48	744	35191	35719	326616
	7.2 Synoptic Flux Computation	18126	80	248	19819	36017	16368
	12.0 Regrid MOA Fields	330	310	31	9598	8593	22320
TISA	6.0 Hourly Fluxes and Clouds, Gridding	324		744			
	6.1 Hourly Fluxes and Clouds, Region Sort	22960	11480	1	11480	12512	6210
	7.1 Single/Mult Satellite Time Interpolation	39894		1			13392
	8.0 Regional, Zonal and Global Averages	21034	1205	1	1205	1234	733
	9.0 TOA and Surface Fluxes, Gridding	270		744			
	9.1 TOA and Surface Fluxes, Region Sort	12422	6210	1	6210	6210	3125
	10.0 Monthly and Regional TOA and SRB	18848	2225	1	2225	2367	1129
	11.0 Grid Geostationary NB Radiances	8416	816	1	816	816	524
	12.1 Post-process MOA	19195		1			
Total				5557	410604	314615	670450

Estimate assumes that CRS output from 5.0 is reduced to just the SARB-unique parameters.

## Estimated Data Product Distribution for TRMM Validation - 4/97

Investigator	Archival Data Products - Number per Month															
	BDS (31)	ES-8 (31)	ES-9 (1)	ES-4 (1)	ES-4G (1)	SSF (744)	CRH (3)	CRS (744)	FSW (1)	SYN (248)	AVG (1)	ZAVG (1)	SFC (1)	SRBAVG (1)	GGEO (1)	MOA (744)
Cess						few										
Coakley						5%										
Crommelynck						30										30
Donner			1	1	1						1	1	1	1		
Kandel	2	4	1	1		few					1					
King																
Miller/Yang					1					248			1	1		
Ramanathan		x	1													
Randall		1			1					1		1	1	1		
Stowe						few										few
Welch	10	10				10	3	10								10
Langley SCF	2	31	1	1	1	744	3	1	1	248	1	1	1	1	1	1

A blank line means that no questionnaire response has been received from the Investigator.

Most Investigators specified the same number of products in each of the first six months, so this chart represents a typical month. Some identified a different sampling strategy and their preferences will be supplied to the DAAC.

The Working Groups at Langley are combined into one line: Langley Science Computing Facility (SCF).

This estimate accounts for only one version of each product each month. There will likely be many versions of some of the products during the first few months after launch. All Investigators may not want all versions!

## DAAC Order Delivery Questions - 4/97

Investigator	Media or ftp?	Standing order or On-Demand?	Fraction of data if subsetting available?	Note
Cess	ftp	On demand	All requested	
Coakley	8mm (5GB)	On demand	5% (by region)	(1)
Crommelynck	ftp	Standing	10%(Meteosat overlap)	(2)
Donner	8mm (5GB), ftp	On demand		(3)
Kandel	8mm, ftp	ES-9, ES-4 standing; others on demand	20% for ES-8, SSF	
King				
Miller/Yang	4mm (2GB)	SYN on demand; others standing	Just one month of SYN	
Ramanathan	8mm (5GB)	Standing	Indian Ocean region	(4)
Randall	ftp or CD-ROM	On demand	All requested	
Stowe	ftp	On demand	7 AERONET sites	(5)
Welch	8mm	Standing	50%	
Langley SCF	ftp	Mixture	1-10% for regional products 33% for instantaneous products	(6)

### Notes:

- (1) Also request 5% of VIRS raw data with calibration and navigation for specific regions (subsets of cookie dough?)
- (2) Will provide software to run at Langley to subset best Meteosat overlap hour from each day for near real time ftp.
- (3) Wants first data starting in June, 1998.
- (4) Subsets of ES8, ES9 over Indian Ocean (fairly large region).
- (5) Subsets of SSF and MOA at 7 sun-photometer sites. Also request full resolution VIRS radiances at same sites. Is there a mapped product for aerosol optical thickness?
- (6) Will require full resolution VIRS raw data as needed to investigate anomalies. Also request validation products such as gridded daily imager and CloudVis subsetting by region.

## **System-Wide Release 2 Issues**

- **Identify and incorporate changes driven by LaTIS**
- **Produce archival data products in Hierarchical Data Format (HDF)**
- **Finalize required metadata for every data product using CERESlib interface to LaTIS/ECS**
- **Use mandatory SDP Toolkit calls and test new Toolkit releases**
- **Produce realistic measurements of computer system resource requirements**
- **Define and implement QC reports: statistical summaries output from each PGE to convince us things are working or identify problems**
- **Update documentation**
  - **Data Products Catalog**
  - **Design Documents**
  - **Data Product User's Guides**
- **Revise Release 2 DAAC delivery procedures to streamline the integration and testing process.**

**Concern: We must make CERES code work on LaTIS to support TRMM, but may have different interfaces with the evolving ECS Release B to support EOS-AM, thus compounding our integration and testing problems.**

## **Release 2 Issues for Each Working Group**

### **Instrument:**

- **Finalize 2nd time constant algorithm**
- **Requirements for post processing reports**
- **Requirements for data analysis/subsetting tools**

### **ERBE-Like:**

- **Final CERES spectral correction coefficients**
- **Need LW seasonal ADMs**
- **Revised elevation offsets for both NOAA 9 and NOAA 10 (ERBE Reprocessing)**

### **Clouds:**

- **Will the VIRS 1.6  $\mu$  channel be used in any algorithm?**
- **MODIS data and impact on system functionality. Retrieve more simulated MODIS data.**
- **What will the operational scenario for CRH be? Current algorithm dictates that the CRH be produced hourly allowing only sequential processing.**
- **Final update of science algorithms before freeze date (Mid May, 1997)**

### **Inversion:**

- **Incorporate Release 2 SSF data product definition changes**
- **Use final CERES spectral correction coefficients**
- **Use revised ERBE ADMs**
- **Use latest submitted version of Model B LW surface estimation algorithm**



## **Release 2 Issues for Each Working Group**

### **SARB:**

- **Use the Fu-Liou model with revised correlated-k distributions to simulate the 8-12 micron window flux. (Operational)**
- **Develop an operational algorithm that tunes the atmospheric fluxes to the estimated surface flux.**
- **Subsystem 12.0: The only expected changes for MOA are directly related to any changes in the input products. (likely an ongoing problem...)**

### **TISA:**

- **Need 'weighted-column-cloud properties' algorithms for Gridding (SS6 and SS9)**
- **Need surface flux estimation algorithms for Averaging (SS10)**
- **Clarify operational scenarios for LaTIS processing system. (TISA may have the most complicated logistical flow with combinations of monthly files)**

## **Near-Term Plans**

- **Tests with live CERES data from TRMM Mission Simulation #2**
- **Complete Release 2 integration and testing on Science Computing Facilities**
- **Begin staged deliveries of Release 2 code to DAAC for LaTIS integration**
- **Use one month of simulated CERES data for LaTIS testing prior to TRMM launch**
- **Maintain compatibility with ECS Release B for EOS-AM processing**